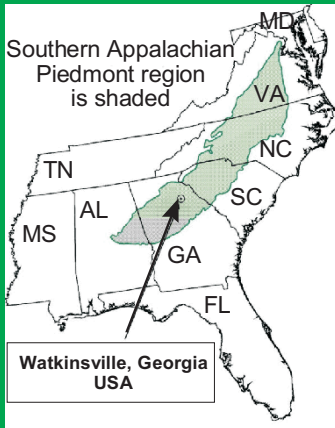




Agricultural Research Service



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Research from the
Soil Resource Management
National Program

JPC Research Note - 10

Bermudagrass Management

Soil pH and Nutrient Cations

Why does it matter?

Soil nutrient dynamics under pastures are important to forage growth and environmental quality. Repeated application of poultry litter to pastures could create excess levels of some nutrients. Forage utilization could affect nutrient dynamics and their distribution within the soil profile.



What was done?

Soil was sampled yearly to a depth of 6" during 5 years of inorganic and poultry litter application to Coastal bermudagrass pastures. Soil pH and extractable nutrient cations (K, Ca, Mg, Zn, Mn, and Cu) were determined in pastures representing a gradient in:

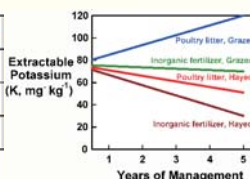
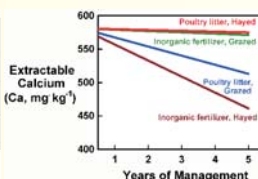
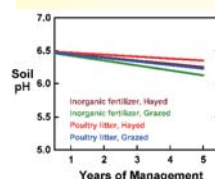
forage utilization \updownarrow high hayed monthly
high grazing pressure
low grazing pressure
low unharvested

What was found?

Poultry litter was a significant source of nutrients, other than N and P, although only a small fraction (<20%) of total elements added were found in soil in plant-available form at the end of 5 years. Haying created a large demand on nutrients with forage removal from system.

Nutrient cations supplied with three different fertilization strategies (lb/acre/year).

Fertilization source	K	Ca	Mg	Na	Al	Fe	Mn	Zn	Cu
Inorganic only	21	163	99	.	.	.	.	.	.
Clover + inorganic	49	82	49	.	.	.	.	.	.
Poultry litter	149	117	25	21	18	13	4	2	2



What's the impact?

Grazing allowed nutrient cycling to occur within pastures. The more diverse and higher quantity of several nutrient cations applied with poultry litter either prevented a decline or contributed to an increase with time.

A full description of this research can be found in the article:

Franzluebbers AJ, Wilkinson SR, Stuedemann JA. 2004. Bermudagrass management in the Southern Piedmont USA. VIII. Soil pH and nutrient cations. *Agronomy Journal* 96: 1390-1399.